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Low Temperature Synthesis of ZnO nanoparticles and Nanorods via Wet Chemistry Route

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A wet chemistry route is an essential method used today to synthesize high quality ZnO nanoparticles and nanorods. It is a novel low cost method to produce nanoparticles and nanorods with relatively high dispersivity. In this study optical properties and morphology of the nanoparticles and nanorods were investigated. The X-ray diffraction (XRD) patterns of both nanoparticles and nanorods revealed the hexagonal wurtzite structure, the diffraction peaks matched well with the JCPDS (card no 80-0075) standard data. The transmission electron microscopy (TEM) revealed the nanoparticles and nanorods with different diameters and lengths. The optical absorption and photoluminescence (PL) were also obtained and it was demonstrated that the PL exhibited a strong near-band-edge emission (UV) and weak visible emission bands. The PL intensity increased with increasing precursor concentration (0.1M-1.5M) and was quenched at higher concentrations, which may be attributed to concentration quenching effects. The Fourier transform infrared spectroscopy (FTIR) was used to determine the distinct stretching mode frequencies. The ZnO nanoparticles and nanorods were investigated for possible applications in transparent electrodes in solar cells and gas sensors.

**Level (Hons, MSc,
 PhD, other)?**

PhD

**Consider for a student
 award (Yes / No)?**

Yes

**Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?**

Yes

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